Plasma-Therm, Inc.
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Telex 83-1604

SEV-2 DC

INSTRUCTION BOOK

MP MASTER
MA30252

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DRAWINGS

SEV 2 DC	B20, 028
Interconnect to APCSIII	A10,087
Preamp Board	A10,037
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Probe, 0-2000VDC/0-5000VDC	A10,058
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SEV 2DC TECHNICAL SPECIFICATIONS

ELECTRICAL CHARACTERISTICS

Construction	All solid state
Frequency	independent of frequency
Power Level	independent of power
Voltage Probes	external to SEV 2DC
Voltage Ranges	0-500 0-2000 0-5000
Meter (standard)	3 1/2 digit
Optional	4 1/2 digit
Optional	BCD output
Response Time	500 msec
Stability	± .1%
Accuracy	± 1%
Preamplifier	common mode rejection

ELECTRICAL POWER REQUIREMENTS

Input Line	115 VAC 50/60 Hz
-12 VDC	obtained from APCSIII
Fuse	MDL 1/2 amp

MECHANICAL DIMENSIONS

Front Panel (19" standard rack)	3.5"	8.9 cm
Depth	10"	25.4 cm
Weight (approximately)	6 lbs	13.2 kg
Finish (standard)	Gray	

SECTION I

DESCRIPTION

1. General: The SEV-2DC is designed to be used in an RF plasma system to measure the developed DC voltage from the plasma or the negative peak RF voltage present. The SEV-2DC is enclosed in an aluminum chassis measuring 3 1/4" H X 17" W X 10" D and is mounted on a standard 3 1/2" front panel.

2. Electrical: The SEV-2DC contains two digital voltmeters with self-contained power supplys. The equipment must be furnished with 115 VAC and -12 VDC which may be taken from the APCS III (Automatic Power Control).

   The necessary voltage divider probes required for operation are external to the SEV and are usually mounted in the matching network. Inputs from the probes enter through rear mounted BNC type coaxial connectors. Supplied with each probe is 20 feet of RG58/U coaxial cable with which to make this connection.

   The SEV-2DC is capable of measuring two independant electrodes (common system or two separate RF systems) and also controlling each one independently. The controller is designed to provide a full ten turns of control over the entire voltage range available.

INSTALLATION

1. Unpacking: Carefully remove the SEV-2DC from its packing carton and inspect for any obvious damage which may have incurred during shipping. Remove the top cover and make certain that all the components are tight and that the edge card connectors are in place.

2. Electrical & Mechanical Installation: The SEV-2DC may be mounted in a standard 19" rack panel in a convenient location. The rack height requirement is only 3 1/2". A clearance of approximately 12" is required behind the front panel.

   Connect the controller to the APCS III as shown in schematic A10,087 using the shielded wire and 18 gauge wire provided. Next, install the 20 foot RG58/U coaxial cables between the voltmeter probes and the rear BNC input jacks as labled. Connect the 115 VAC line cord to a nearby outlet. DO NOT USE A 2 WIRE ADAPTER FOR THE LINE CORD - THE DIGITAL METERS MAY BE PERMANENTLY DAMAGED!

SECTION III

OPERATION

Place the APCS III into Automatic Control, Incident OFF, reflected OFF. Turn the Auxiliary switch to the ON position. Apply power to the system allowing the matching network time to tune the reflected power to nearly zero (NOTE: 10 turn potentiometer on controller should be at maximum.) A voltage should now be observed on the digital meter and by varying the 10 turn potentiometer the voltage may be adjusted to the desired level. The power level necessary to obtain the desired voltage cannot exceed the level of the 270° manual power control, which, therefore, must be set to a higher level than the desired operating level.

The SEV-2DC will hold the voltage within ± .1% after a short warm up period. Most of the drift observed will be caused mainly from the meter itself and will stabilize in approximately 20-30 minutes.

An SEV-2DC equipped with a 500 volt probe will rear 1999 volts full scale therefore, the voltage may be read directly in volts.

The same applies for a 2000 volt meter.

For a 5000 volt meter with 3 1/2 digit meter the last digit will not be displayed. With the optional 4 1/2 digit meter the voltage full scale will be 1999 and 5000 volts may be read directly in volts.

SECTION IV

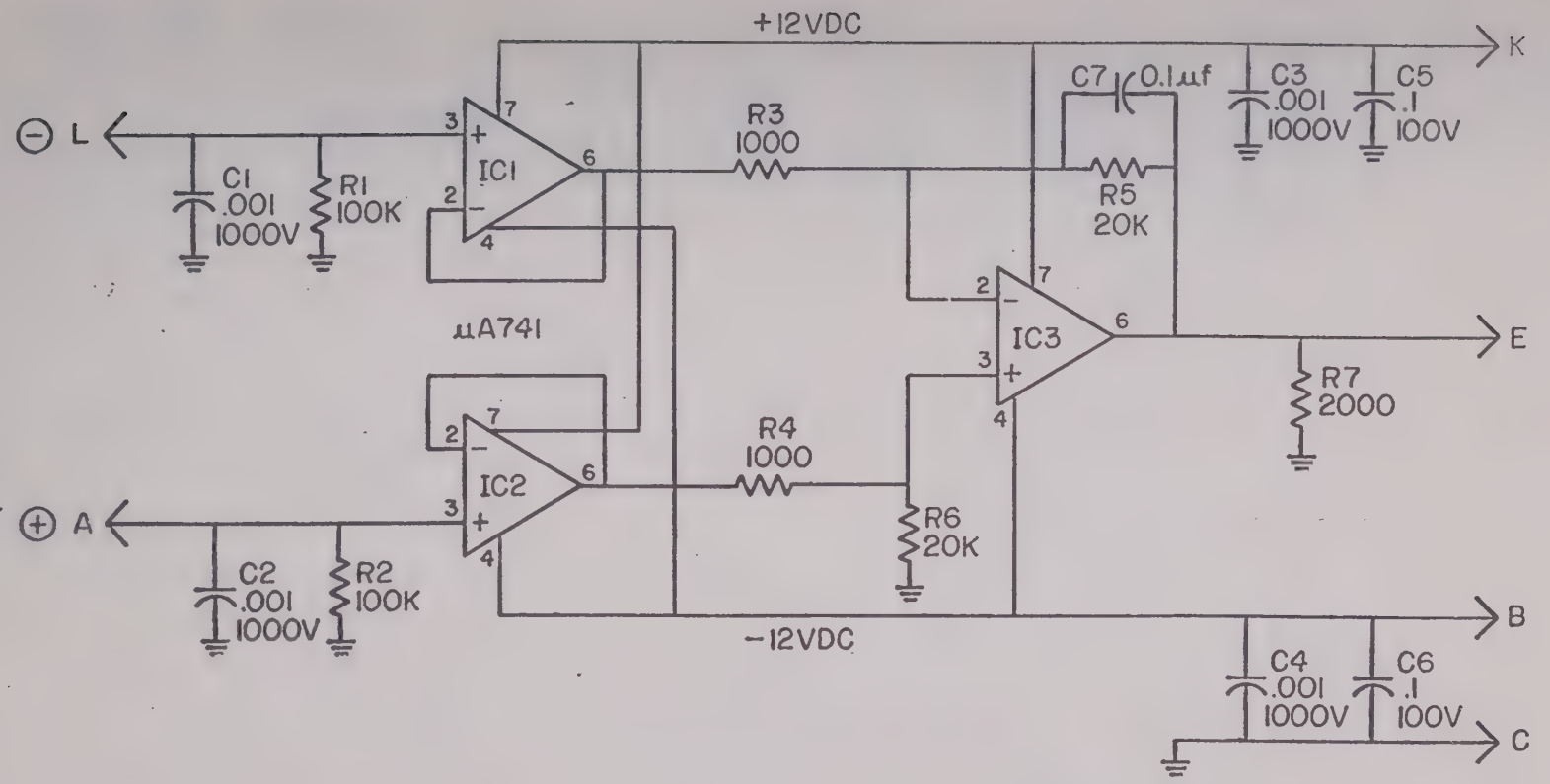
TECHNICAL SPECIFICATIONS

The Plasma-Therm, Inc., model SEV-2DC is designed to provide a constant voltage level within an RF plasma system. This voltage level will remain constant with varying load changes (pressure, gas flow, etc.) by sampling the voltage on the electrodes and feeding back a small portion of this voltage.

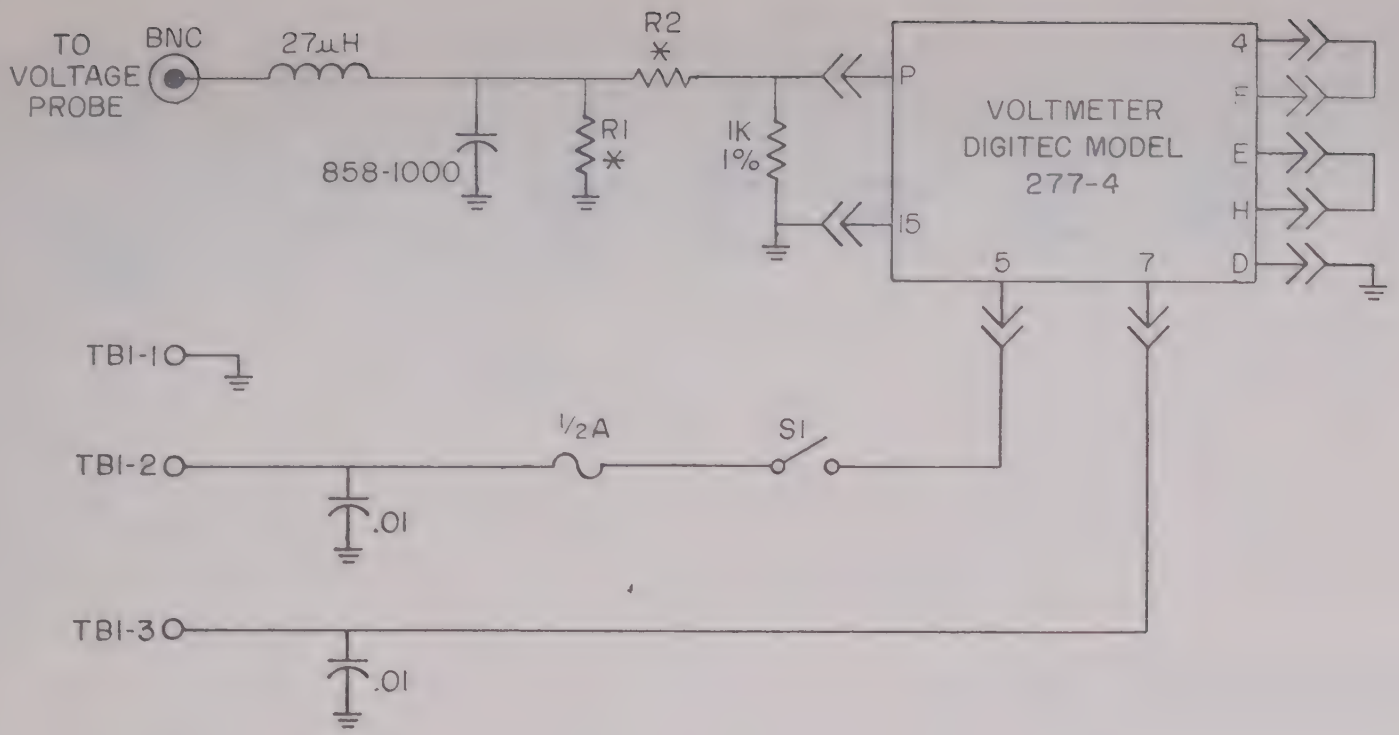
A voltage divider network (normally installed in the matching network) provides the necessary feedback signal which is applied to the voltage controller (SEV-2DC) by way of an RG58/U coaxial cable. One probe and one cable are required for each half of the voltmeter panel. Generally these are denoted as TARGET (high voltage) and SUBSTRATE (low voltage), however, this may not always be the case. They may also be referred to as CATHODE and ANODE.

A rear mounted BNC connector is provided for each section of the voltmeter panel providing the necessary low level signal to calibrate the digital voltmeter. This voltage is also used to provide the preamplifier board (mounted in the APCS) with one of its two input signals. The second input to the preamplifier board is obtained through a 10K calibration potentiometer, R7 (or R8) and a 1K 10 turn potentiometer, R9 (or R10), mounted in the SEV-2DC. With one end of R9 (or R10) being placed at ground potential counter-clockwise and the other end clockwise [illegible], having a negative voltage applied, this circuit becomes a voltage divider and provides the "referance" voltage for the preamplifier. The reference voltage is applied to pin L of the preamplifier board with the interconnection shown in drawing A10,087. The voltage from the probe is applied to pin A of the preamplifier.

The APCS mounted preamplifier operation is covered in the APCS manual and reference to this manual should be made for further detailed explanations.

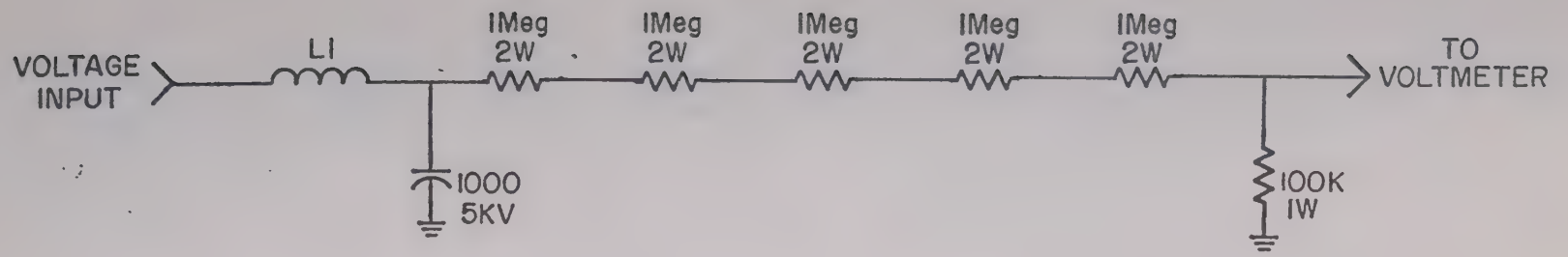


REVISIONS			Plasma-Therm, Inc.		
No.	Date	By			
1			SCHEMATIC DIAGRAM POWER CONTROL PRE-AMP		
2					
3			Used on: HFS 10,000E		
4			Drawn By NAL	Date 12-17-76	Drawing No. A10,037
5			Approved Jen Wyatt	Date 12/17/76	



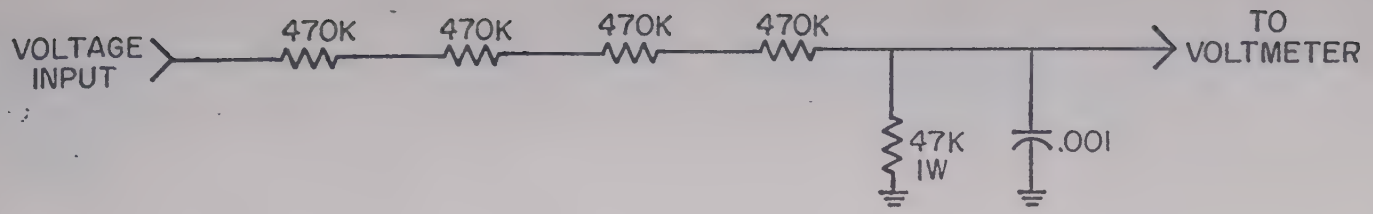
* FACTORY DETERMINED

REVISIONS			Plasma-Therm, Inc.		
No.	Date	By			
1			SCHEMATIC DIAGRAM DIGITAL VOLTMETER		
2					
3			Used on: SEV-1D		
4			Drawn By NAL	Date 11-14-77	Drawing No. A10,057
5			Approved RB	Date 5-9-79	

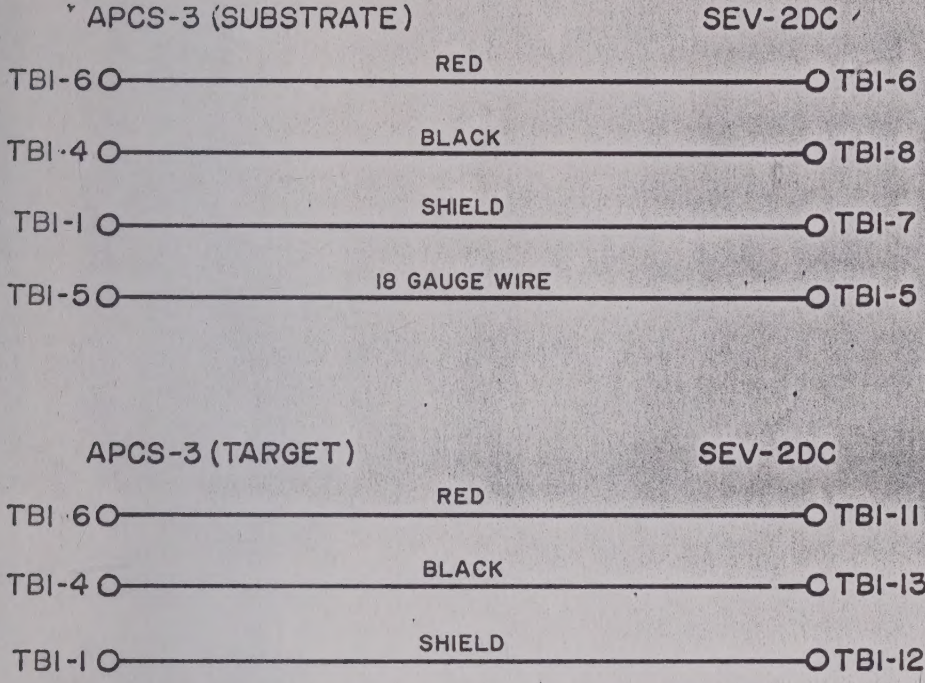


NOTE: For 0-2000VDC Use Only
Two (2) 1Megohm, 2 Watt Resistors

REVISIONS			Plasma-Therm, Inc.		
No.	Date	By			
1			SCHEMATIC DIAGRAM 0-5000VDC PROBE		
2					
3			Used on: SEV-ID		
4			Drawn By NAL	Date 11-14-77	Drawing No. A10,058
5			Approved	Date	



REVISIONS			Plasma-Therm. Inc.		
No.	Date	By			
1			SCHEMATIC DIAGRAM 0-500VDC PROBE		
2					
3			Used on: SEV-ID		
4			Drawn By NAL	Date 11-14-77	Drawing No. A10,059
5			Approved	Date	



REVISIONS			Plasma-Therm. Inc.		
No.	Date	By			
1	4-19-79	RJB	INTERCONNECTION DIAGRAM APCS-3 TO SEV-2DC		
2					
3			Used on: APCS-3		
4			Drawn By NAL	Date 12-18-78	Drawing No.
5			Approved RJB	Date 5-9-79	A10,087

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